



NASA Glenn Research Center

**Presentation to the
Commercial Space Committee,
NASA Advisory Council**

Ramon Lugo, Director

May 1, 2012

Topics

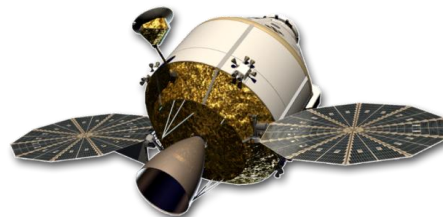
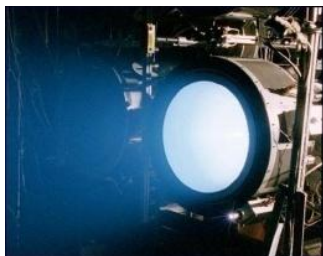
- GRC Overview
 - GRC Mission
 - GRC Strategic Goals
 - Organization
 - Resources
 - Core competencies
- Response to Key Space Committee Questions
- Concerns or issues related to transitioning to the Agency's commercial space strategy





Vision and Mission

- **NASA Vision**: To reach for new heights and reveal the unknown, so that what we do and learn will benefit all humankind
 - **NASA Mission**: Drive advances in science, technology, and exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of the Earth
- **Glenn's Mission**: We drive research, technology, and systems to advance aviation, enable exploration of the universe, and improve life on Earth





Glenn Research Center Goals

NASA Glenn Strategic Action Plan

- Provide world class R&T, revolutionizing aeronautics and space exploration
- Advance space missions and aeronautics by leveraging our core competencies to deliver concept-through-flight systems
- Deliver program and project management excellence that results in successful missions for our customers and challenging, long-term assignments for continued achievements
- Provide excellent institutional capability to enable NASA mission success
- Be an integral part of the Ohio community and the Nation

Glenn Research Center



Lewis Field (Cleveland)

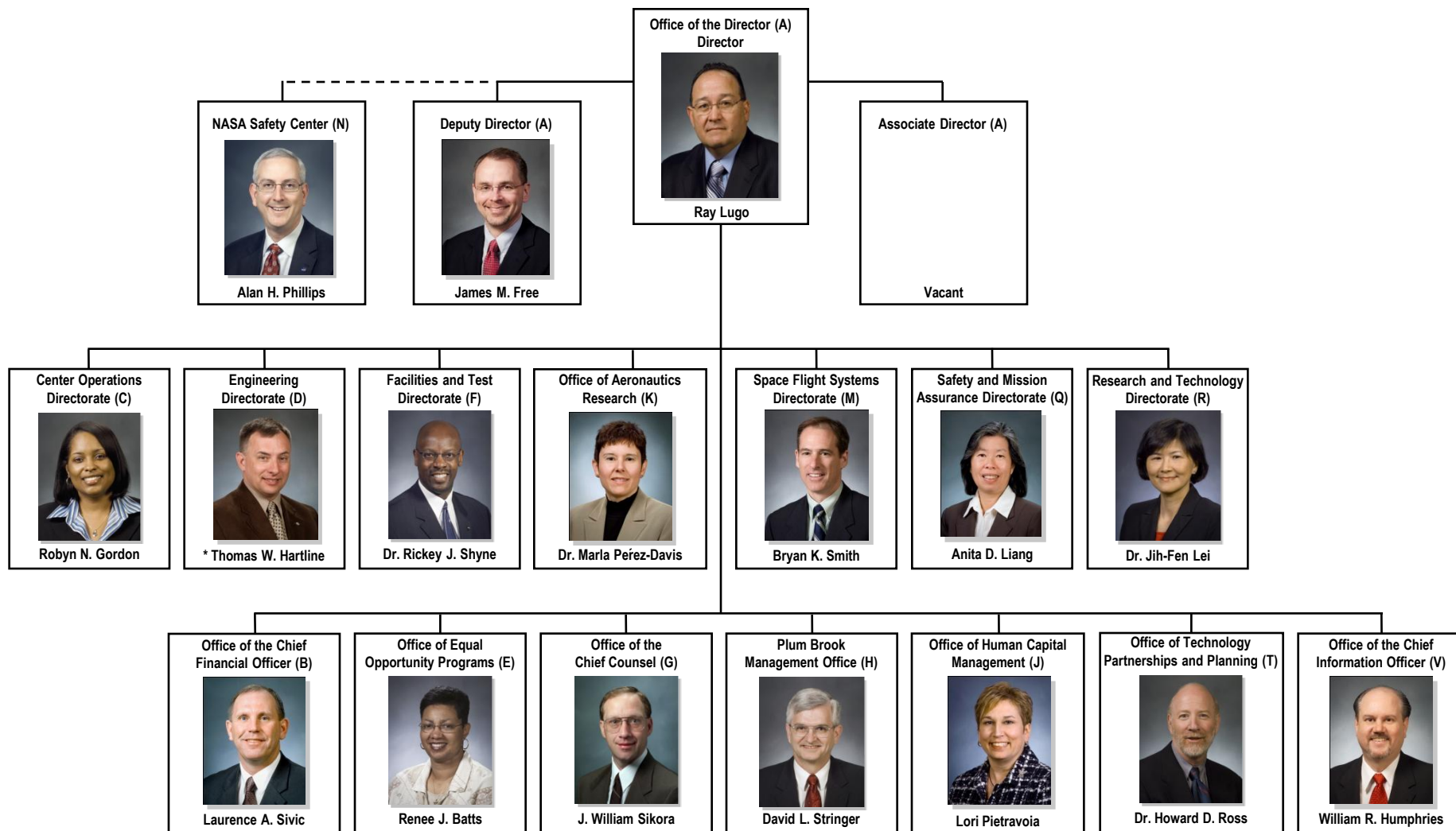
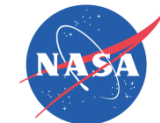
- **350 acres**
- **1639 civil servants and 1577 contractors**

Plum Brook Station Test Site (Sandusky)

- **6500 acres**
- **13 civil servants and 113 contractors**



NASA Glenn Research Center Senior Management

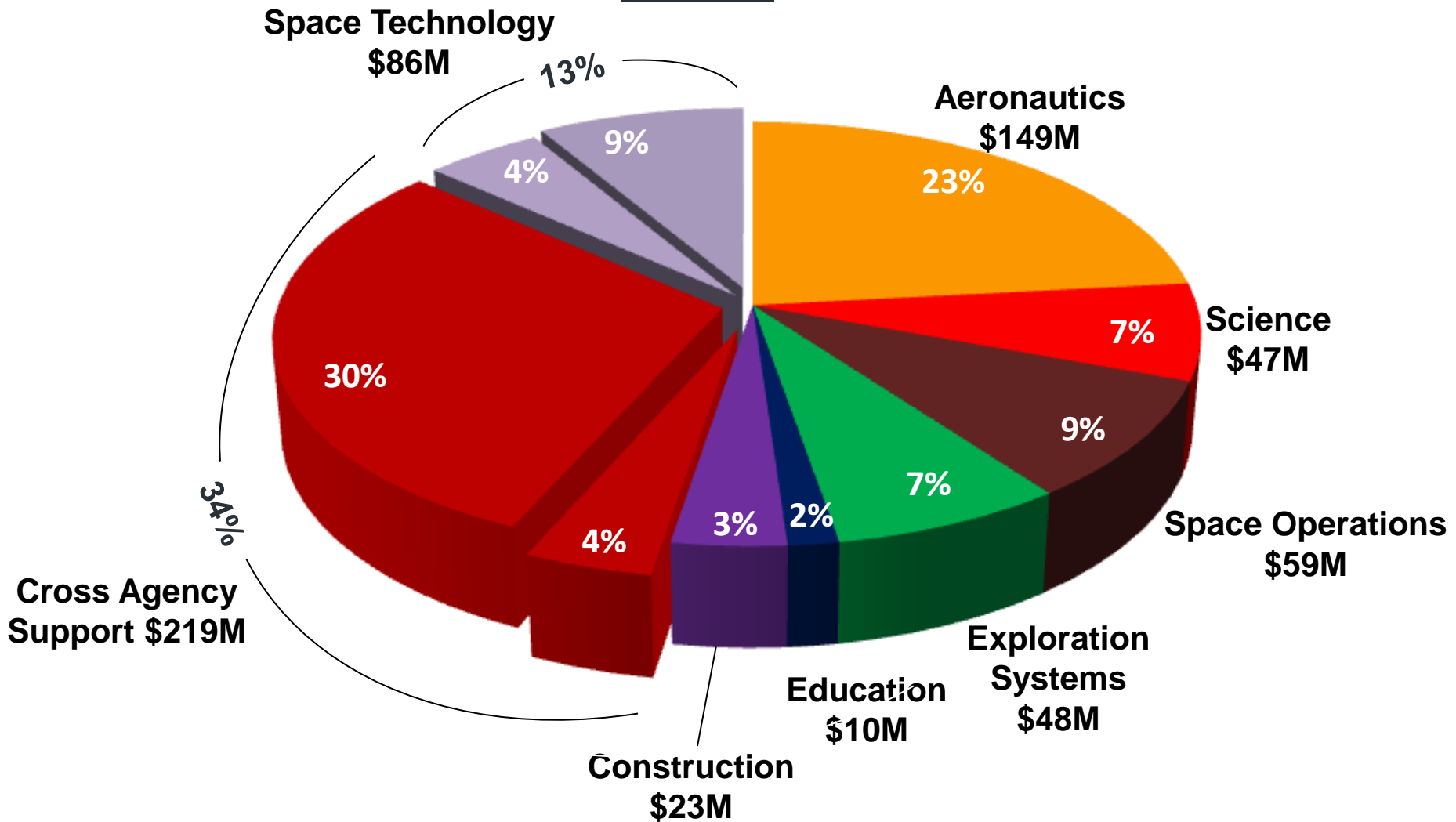


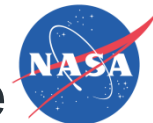
*Acting



GRC 2012 Funding Profile

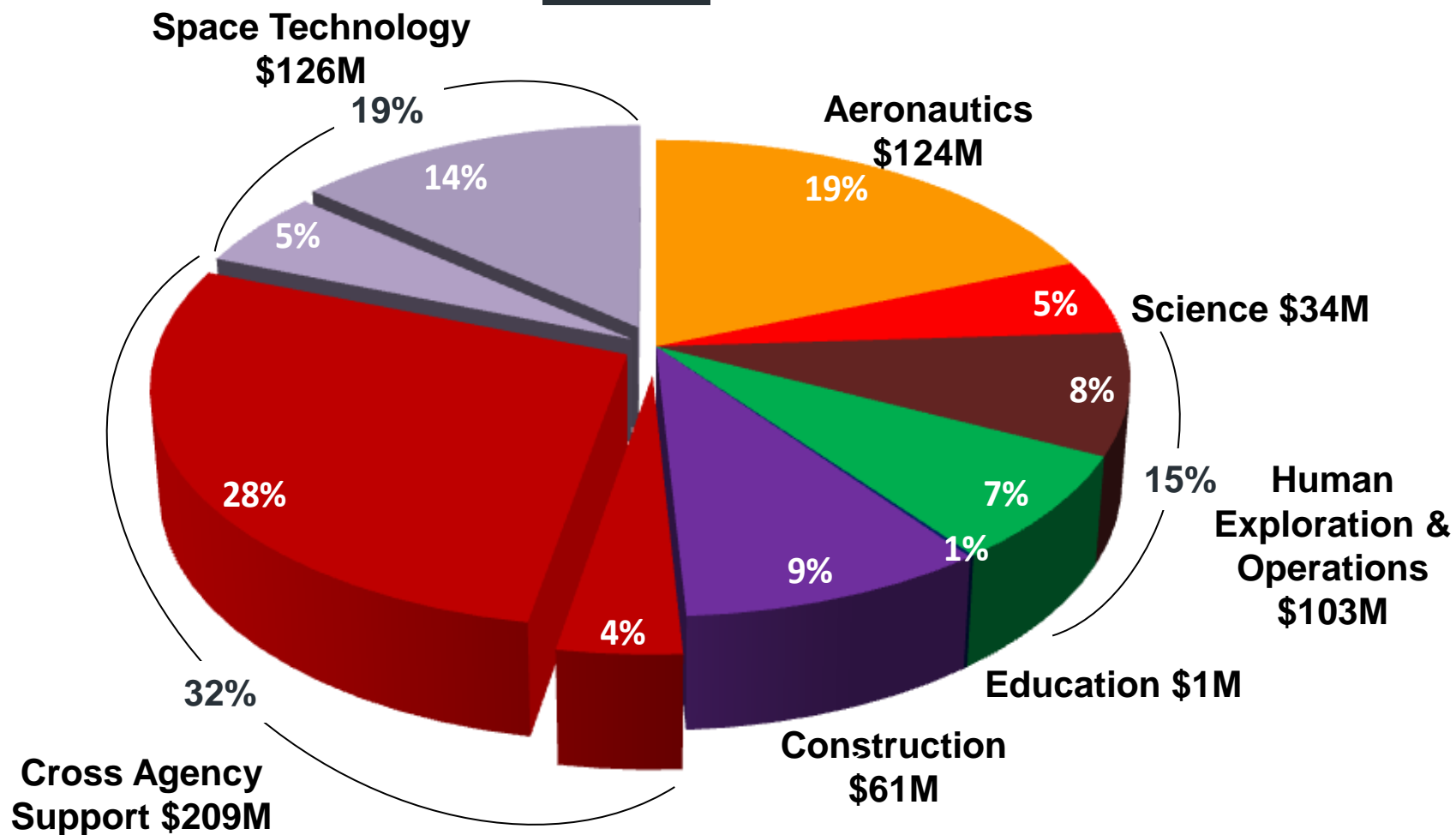
\$641M





GRC 2013 President's Budget Request Funding Profile

\$658M





Civil Service Workforce

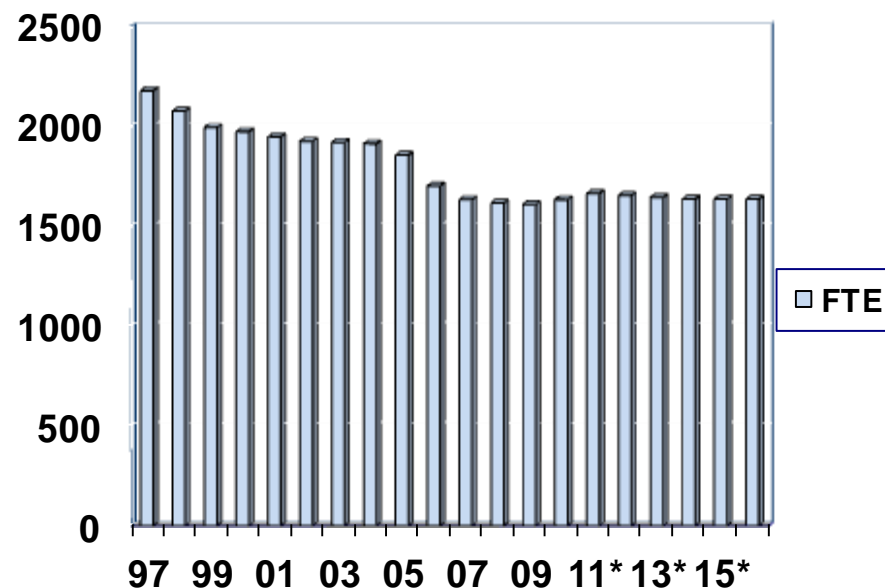
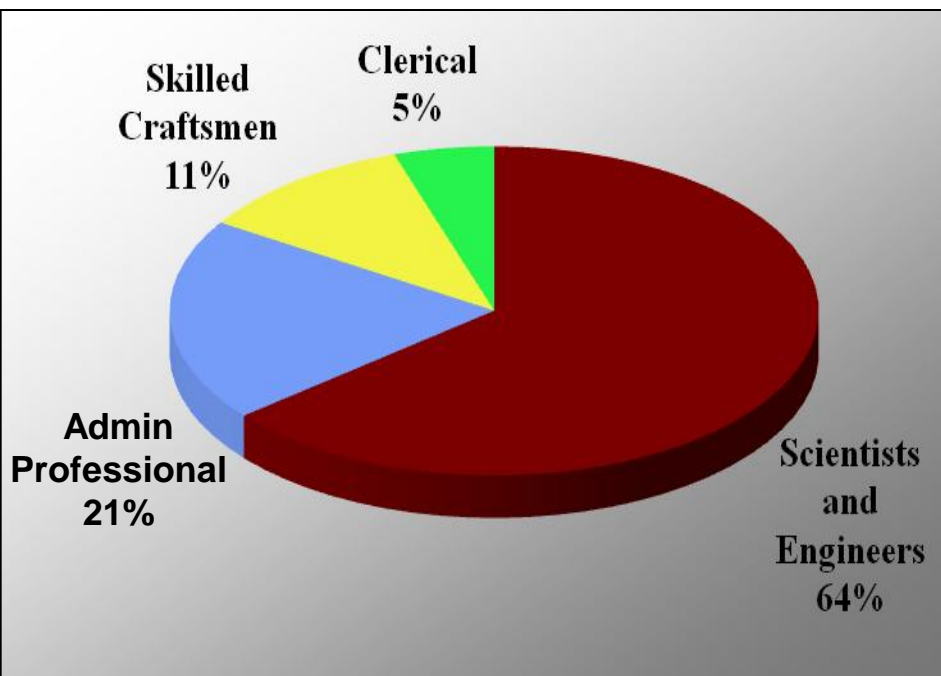
- 66 percent of workforce charges their time directly to the technical mission
- 69 percent of scientists and engineers earned advanced degrees, 25 percent with PhDs



**Administrative
and Clerical**

**Scientists and
Engineers**

**Skilled
Craftsman**

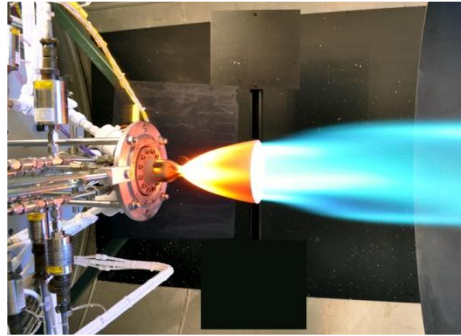


*Projected Workforce Level

Glenn Core Competencies



Air-Breathing Propulsion



**In-Space Propulsion and
Cryogenic Fluids Management**



**Physical Sciences and
Biomedical Technologies in Space**



**Communications Technology
and Development**



**Power, Energy Storage and
Conversion**



**Materials and Structures
for Extreme Environments**



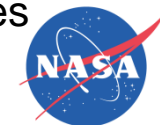
Response to Key Space Committee Questions

1. How is the Agency's Commercial Space Strategy perceived at GRC?
2. What is GRC doing to promote commercial space?
3. What are the Center's plans for transitioning from Shuttle and Constellation programs to the new Agency direction that includes commercial space, and how are those plans progressing?
4. How is GRC planning to use its facilities for commercial space activities?
5. How is GRC's addressing excess capacity issues?



Response to Key Space Committee Questions

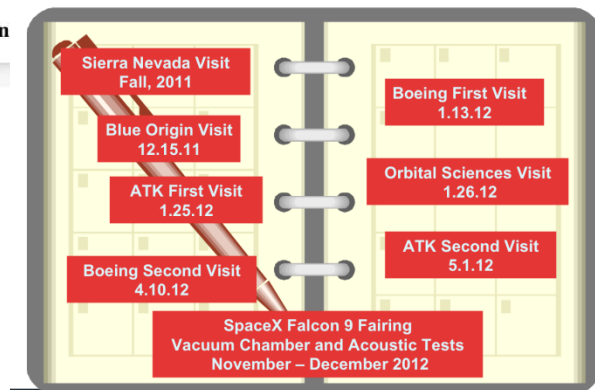
1. How is the Agency's Commercial Space Strategy perceived at GRC?
 - NASA GRC understands that the Commercial Space Strategy is core to NASA's future
 - Enables NASA's move to deep space exploration around which GRC's skills are well suited (e.g. MPCV and SLS)
 - GRC's diversified space background is well-suited for such a transition
 - GRC has supported other transitions in earlier programs through it's research and technology development

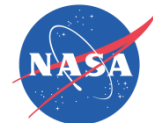


Response to Key Space Committee Questions

2. What is GRC doing to promote commercial space?

- NASA GRC has been engaging with commercial space providers for some time to provide detail into GRC capabilities** and technologies
 - GRC emphasizes Commercial Space in New Business Board
 - Established single POC for **all** Commercial Space activities
 - GRC has supported other transitions in earlier programs through it's research and technology development
 - GRC has regular interface mtgs w/commercial space entities
 - GRC works several related business pursuits as well





Response to Key Space Committee Questions

3. What are the Center's plans for transitioning from Shuttle and Constellation programs to the new Agency direction that includes commercial space, and how are those plans progressing?
- NASA GRC continues to maintain leadership roles in Agency program shift while developing GRC's added value to commercial space
 - GRC continues to lead on elements of MPCV (e.g. ESA Service Module, Qualification at Plum Brook)
 - GRC working closely with SLS program to carry over previous element expertise (e.g. TVC, power sys, fairing development)
 - GRC has demonstrated our expertise to commercial space providers through work already complete, what is currently underway and numerous areas being explore

GRC Capabilities in application **today!**

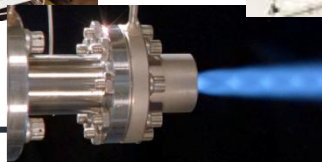
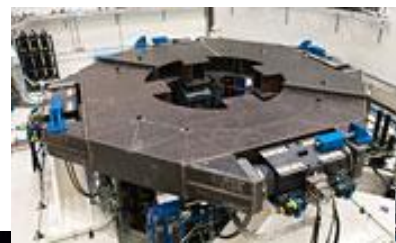
- Aero/Space Test Facilities
- Mission design/Stage Development
- Aerothermal Seals
- Power Systems (Generate, Store, Manage)
- Propulsion (Cryogenic, Electrical)
- Communication (High Frequency, Analyses)

Commercial Space

NASA Exploration

Response to Key Space Committee Questions

4. How is GRC planning to use its facilities for commercial space activities?
 - NASA GRC has test facilities that offer unique and comprehensive coverage for any commercial space activities
 - GRC's facilities span atmospheric and space environment conditions in an unparalleled manner
 - GRC's facilities offer significant and necessary test facility scale as well as unique depth of test condition
 - GRC has already signed SAAs for test facility usage with several additional already in negotiation
 - Several signed pending commercial space downselect
 - GRC understands how to work in commercial environment





Response to Key Space Committee Questions

5. How is GRC's addressing excess capacity issues?
- NASA GRC has transitioned it's workforce from Constellation without significant issues
 - GRC has maintained workforce levels in MPCV and is in the process of working with SLS on role definition
 - GRC has assumed leadership roles within the Office of Chief Technologist which involve larger workforce needs
 - GRC's has continued solid, level aeronautics work with little fluctuation
 - GRC currently does not have excess capacity issues & continues monitoring during workforce planning process



Concerns or issues related to transitioning to the Agency's commercial space strategy

- Space Act Agreement process is critical for usage of NASA capabilities
 - Commercial space entities need nimbleness in SAA process
 - GRC has unique perspective from significant commercial aeronautics works
- Access to NASA capabilities is key to commercial success
- NASA maintenance of some critical test capabilities is necessary for both NASA and commercial missions

